



# First record of Coyote, *Canis latrans* (Carnivora, Canidae), in the Mayan Mountain region of Belize

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## Abstract

Based on the most recent models, Coyotes (*Canis latrans*) are believed to reside throughout North and Central America in many regions marked by human disturbances. Although some field guides list *C. latrans* as residing in Belize, the IUCN and the most current models do not. Herein we provide the second published sighting of a *C. latrans* from camera traps in Belize, and the first from the Mayan Mountain Region of the country.

## Keywords

Camera trapping, mammal, range expansion.

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## Introduction

The current range of Coyote, *Canis latrans* (Say, 1823), extends from Alaska to Panama and from coast to coast in grasslands, arid regions, and other areas marked by human disturbance (Cluff 2006; Reid 2009; Hody and Kays 2018; IUCN 2019). Historically, *C. latrans* existed throughout the western two-thirds of North America; however, since the 1900s *C. latrans* have expanded in all directions of their range, representing one of the fastest growing expansions of any North American mammal (Hidalgo-Mihart et al. 2004; Laliberte and Ripple 2004; Hody and Kays 2018). Despite this rapid colonization into new regions, including Central America, records of *C. latrans* from Belize are sparse.

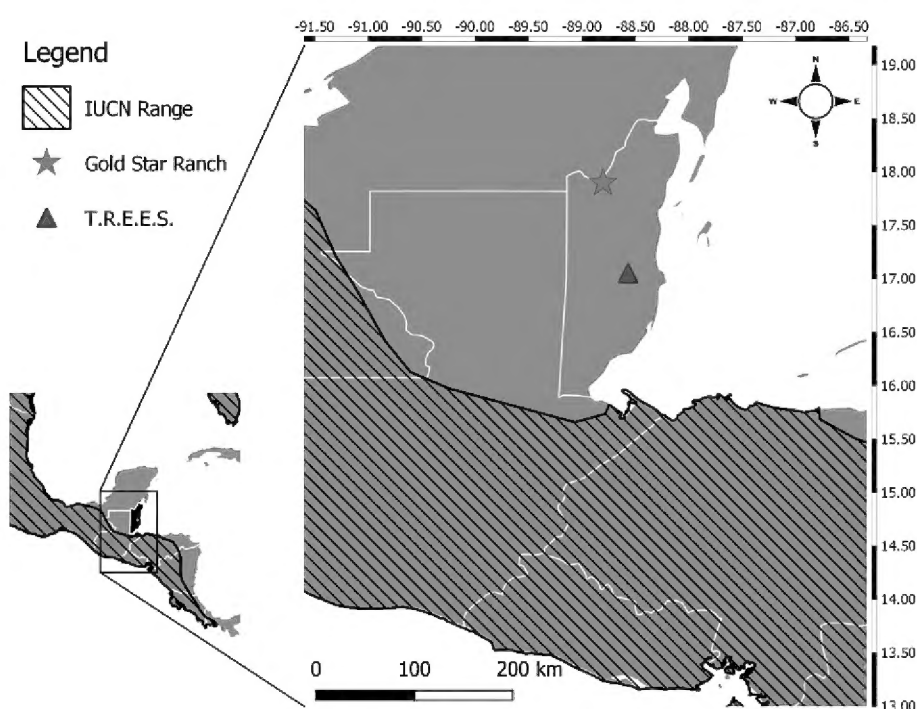
## Methods

Camera traps have been set up around the Toucan Ridge Ecology and Education Society (TREES) property since

2014. Locations are along trails and all cameras are set to motion capture with some taking pictures and some recording video. Traps are frequently replaced due to environmental stress, as such, makes and models of camera are inconsistent (make and model for these sightings are listed in results). Cameras are checked fortnightly, at which time batteries are replaced and files are extracted to an external hard drive. Media files are checked manually, with all wildlife recordings recorded with date, time, environmental variables (if available), and the file name.

## Results

Photos of at least one *Canis latrans* were captured on 29 March 2019 at 10:36h and again on 10 April 2019 at 5:34h at the TREES research station (17°03'08.42"N, 088°33'56.4"W) (Figs 1, 2). Since we are unable to positively identify unique individuals, we have presented these results as two independent sightings; however, it



**Figure 1.** Current range of *Canis latrans* and recorded sightings in Belize. The current range of *C. latrans* is shown by the dashed lines. The TREES property is represented by the green triangle. The Gold Star Ranch (the first sighting of *C. latrans* in Belize) is represented by the gold star.

is entirely likely that these sightings represent the same individual. The camera was a Bushnell model 119676C that takes a single photo when the IR sensor is triggered. The camera was attached to a tree pointing down a hiking trail.

**New records.** BELIZE • 1; Stann Creek District, 27.5 Hummingbird Highway; 17°03'08.42"N, 088°33'56.4"W; 29 March 2019 at 10:36 h; TREES staff leg; Camera Trap. • 1; same collection data as for preceding; 10 April 2019 at 5:34 h.

**Identification** The *C. latrans* pictured can be identified from a domestic dog by the erect ears, non-curved tail, narrow chest, and a long narrow snout (WDNR 2019). There are no other species in this region that could be confused for *C. latrans* (Reid 2009).

## Discussion

Camera traps projects have been operating at TREES since 2014, and other camera trap projects have been conducted throughout Belize (Silver et al. 2004; Dillon 2005; Harmsen et al. 2010; Soriero et al. 2018). However, to our knowledge, this is the first published sighting of a *C. latrans* in this region and the second published sighting of *C. latrans* in Belize.

*Canis latrans* are generalist predators that exhibit wide variations in home range, diet, and other pertinent life history traits (Holzman et al. 1992; Crimmins et al. 2012; Kenaga et al. 2013, Ward et al. 2018). Additionally, they exhibit a large degree of behavioral plasticity, allowing them to easily colonize novel habitat types, particularly in disturbed and urban areas (Sol et al. 2013). This, combined with increased deforestation, agricultural expansion, and other human induced disturbances, has allowed Coyotes to expand further into Central America (Platt et al. 1998; Hidalgo-Mihart et al. 2004; Hody and Kays 2018).



**Figure 2.** Coyote Sightings. At least 1 Coyote was spotted on the property during 2 different dates. The first (top picture) was captured on 3-29-2019 at 10:36 AM. The second was captured twice (bottom pictures) on 04-10-2019 at 5:34 AM.

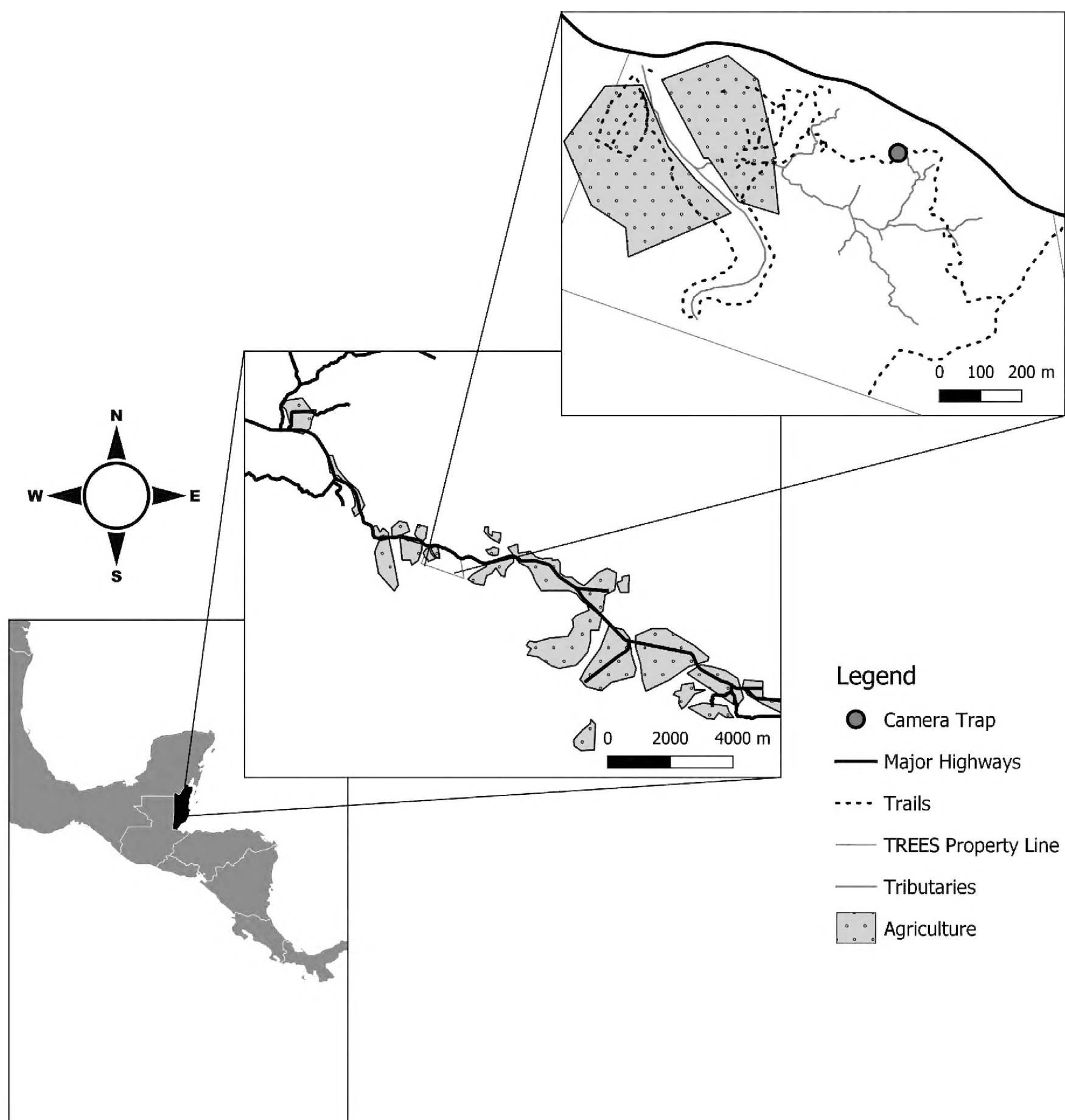
The existence of Coyotes in Belize and the greater Yucatan Peninsula, has been referenced in several papers, but very few sightings have been recorded (Sosa-Escalante et al. 1997; Platt 1998; Hidalgo-Milhart et al. 2004). Although some field guides list *C. latrans* as possibly being within Belize (Reid 2009), the IUCN has never listed them in the country (IUCN 2019). *Canis latrans* likely resided in the northern part of Belize during the Maya Post-Classic Period (1100–500 BP) based on archaeological remains, and contemporary models place them as possibly being in northern Belize

(Hidalgo-Milhart et al. 2004). However, the only published sighting of a *C. latrans* in Belize occurred in 1998, when one Coyote was caught at the Gold Star Ranch in northern Belize (Fig. 1) with two more sightings following shortly after (Platt 1998). No published reports from Belize have appeared since then.

The site at which *C. latrans* was photographed is located in central Belize at the TREES research station. The station is situated on 81 ha of primarily moist broad-leaf forest with an approximately 4 ha of manicured organic orchard (Fig. 2). TREES has maintained camera traps for over five years, amassing a large number of positive wildlife captures in several different habitat types on the property. Common species of mammal photographed include: Agouti (*Dasyprocta punctata* (Gray, 1842)), Paca (*Cuniculus paca* (Linnaeus, 1766)), Nine-Banded

Armadillo (*Dasypus novemcinctus* Linnaeus, 1758), White Collared Peccary (*Pecari tajacu* (Linnaeus, 1758)), Jaguarundi (*Herpailurus yagouaroundi* (Geoffroy Saint-Hilaire, 1803)), Jaguars (*Panthera onca* (Linnaeus, 1758)), Puma (*Puma concolor* (Linnaeus, 1771)), and Margay (*Leopardus wiedii* (Schinz, 1821)). Despite thousands of positive wildlife captures, this is the first time a *C. latrans* has been noted on the property, either through camera traps, tracks, or by any other means.

TREES is adjacent to the Chiquibul/Mayan Mountain Massif, a 505,000 ha, intact, block of tropical forest in southwestern Belize (Briggs 2013). Immediately surrounding the property, are several heavily disturbed parcels of land primarily used for agriculture (Fig. 3). Some authors have noted that cleared agricultural land may create suitable habitat for *C. latrans* in the Yucatan



**Figure 3.** Map of area surrounding TREES showing disturbed areas. This figure displays the disturbed areas around TREES in green. Most disturbed areas are agriculture areas for lime orchards. Tributaries on the TREES property are displayed in blue and roads are shown in black. The location of the camera trap on the property is given by the red circle.



Peninsula, including Belize (Sosa-Escalante et al. 1997; Platt et al. 1998; Hidalgo-Mihart et al. 2013). Although dense forested regions have been postulated to be unsuitable for Coyotes, populations in northeastern North America often exist in forests while hunting in adjacent rural regions (Crête et al. 2001; Richer et al. 2002). Thus, it is entirely possible that a *C. latrans* may be using the surrounding forest of TREES as marginal habitat while hunting in the disturbed areas.

While species distribution models are no doubt useful tools for wildlife conservation, positive sightings are paramount in developing accurate projections. Species such as *C. latrans* have been rapidly expanding their range. However, current range estimates rely on incomplete data about the presence of *C. latrans* (Hody and Kays 2018). As such, it is paramount that sightings of these species are properly recorded and made available for the scientific community.

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## Authors' Contributions

DJ oversaw the camera trap data collection in 2019, performed the literature review and figure creation. MRC provided support for the camera trap project since its creation. VK is the lead for the camera trap project at TREES and helped clarify local knowledge of the areas displayed in our figures; DJ, MRC, and VK wrote the text.

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